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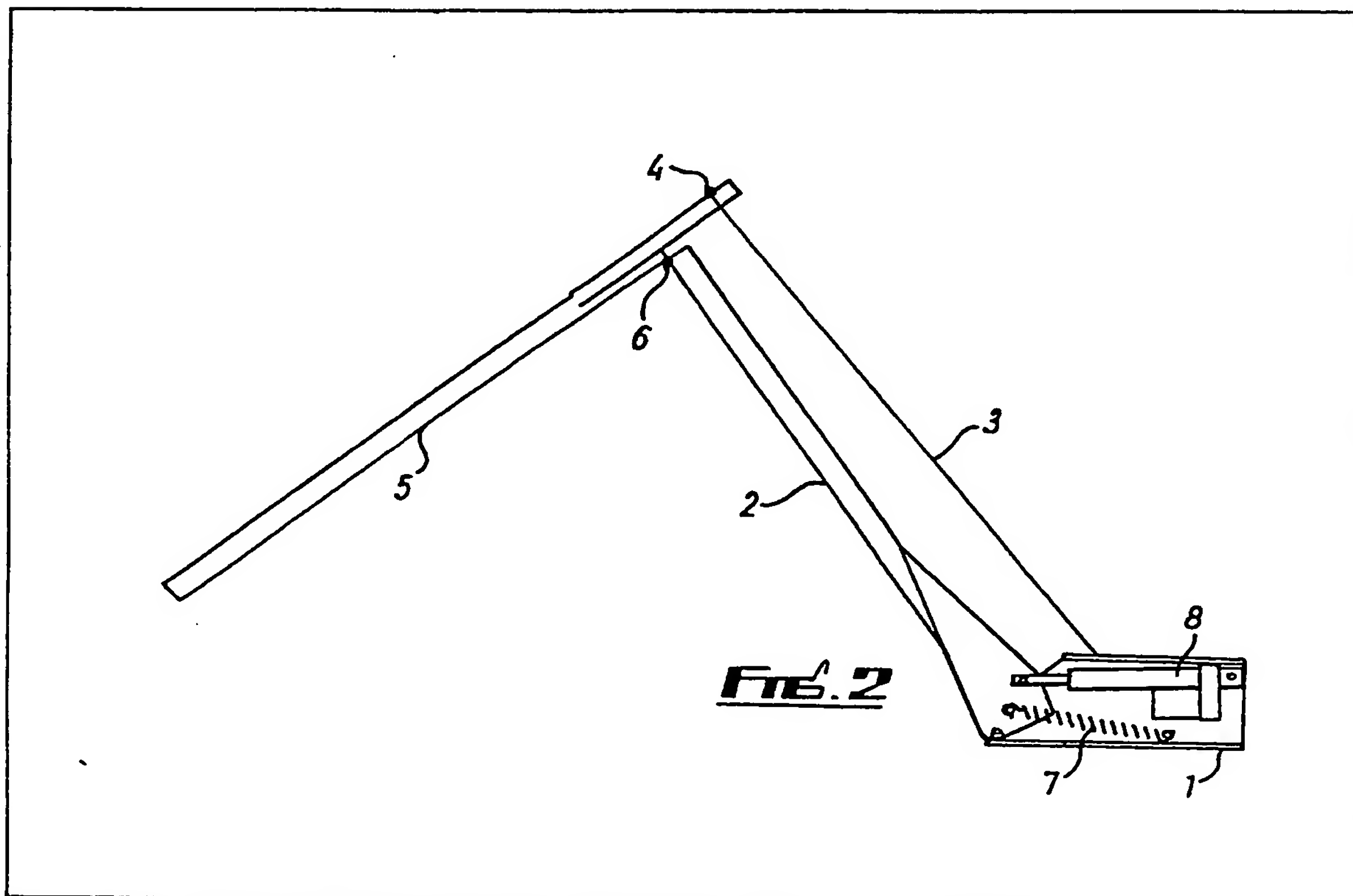
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(54) Collapsible ramp

(57) A collapsible ramp, particularly for provision of access to vehicles by disabled persons, comprises a first section (2) pivotally secured to a support (1), a second section (5) pivotally secured to the first and a linkage (3) extending between the support and the second section, the ramp being movable between a collapsed position and an extended position, the linkage (3) causing the sections (2), (5) to form a continuous surface when extended.

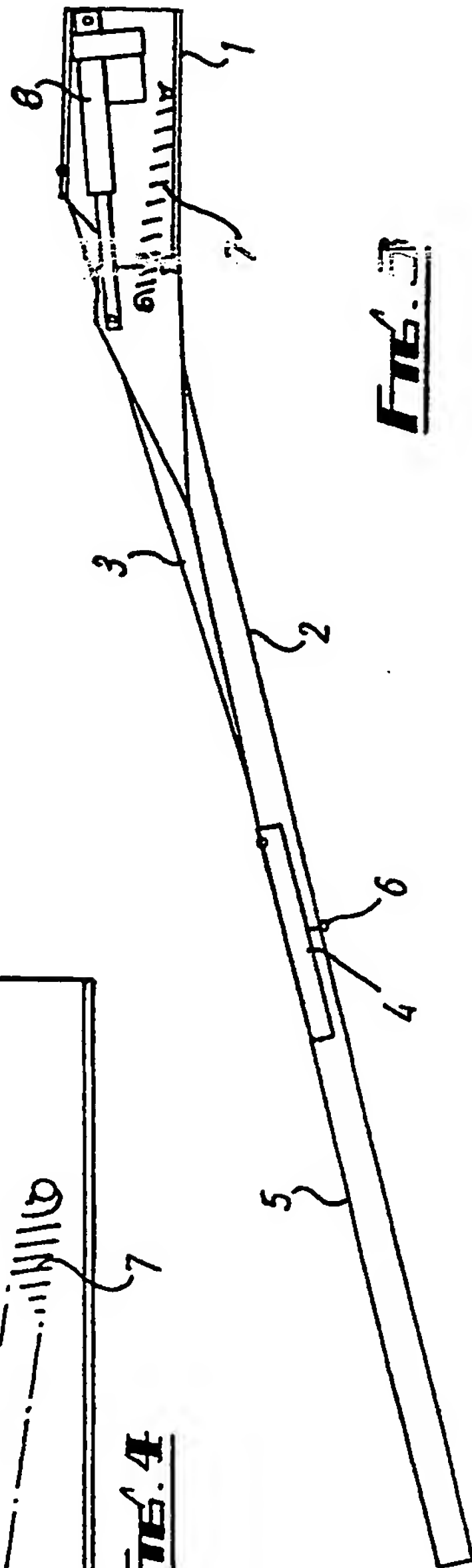
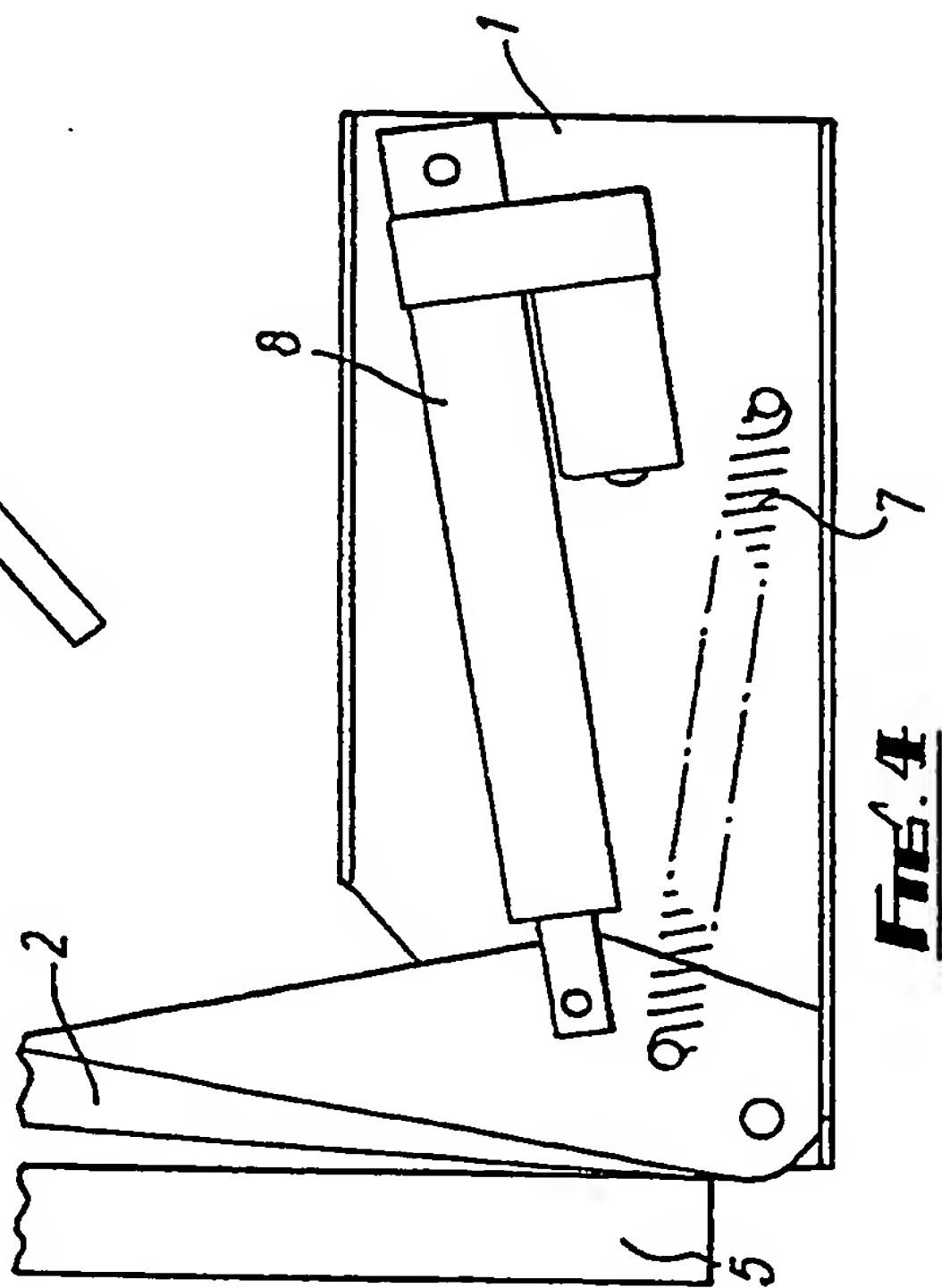
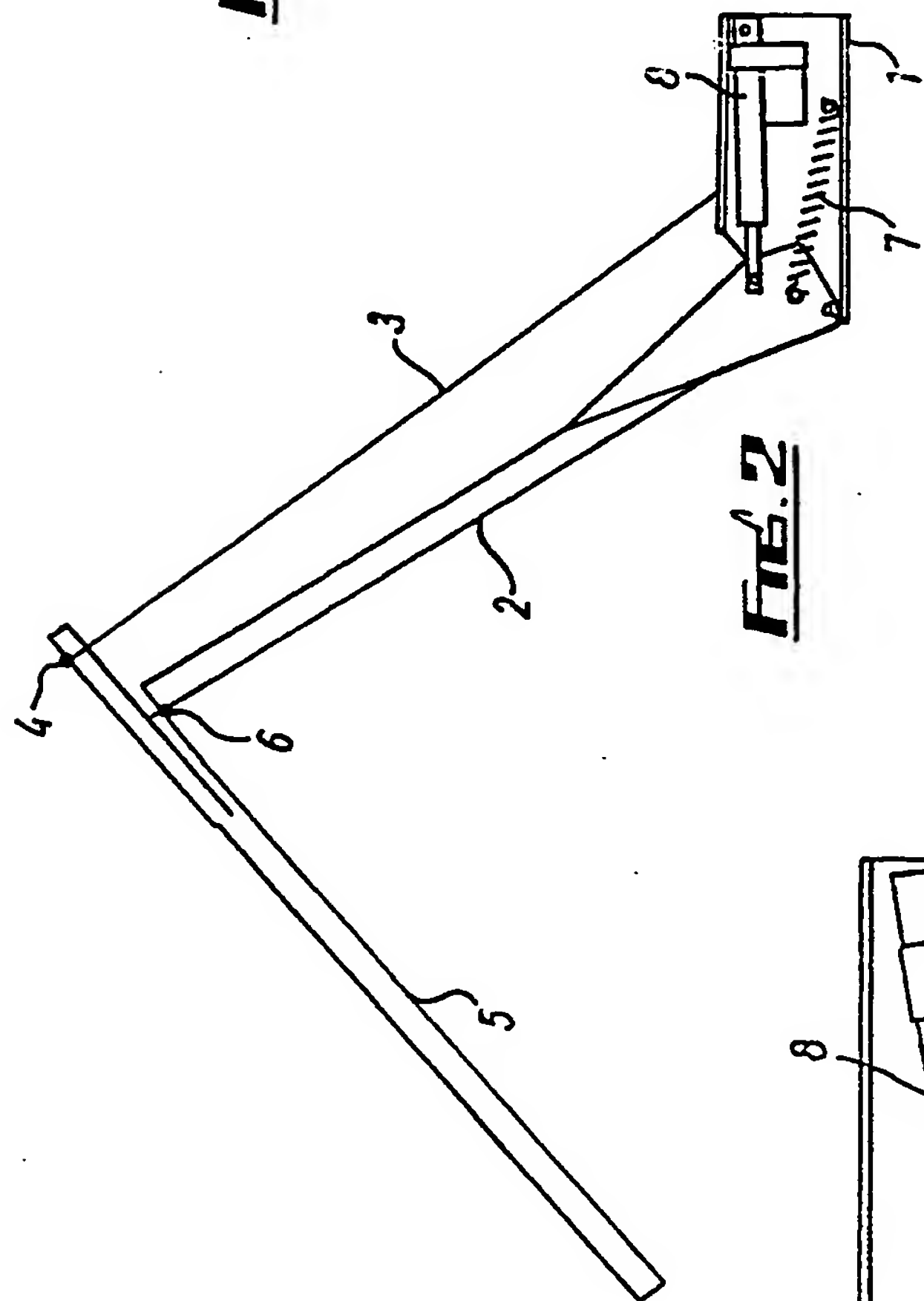
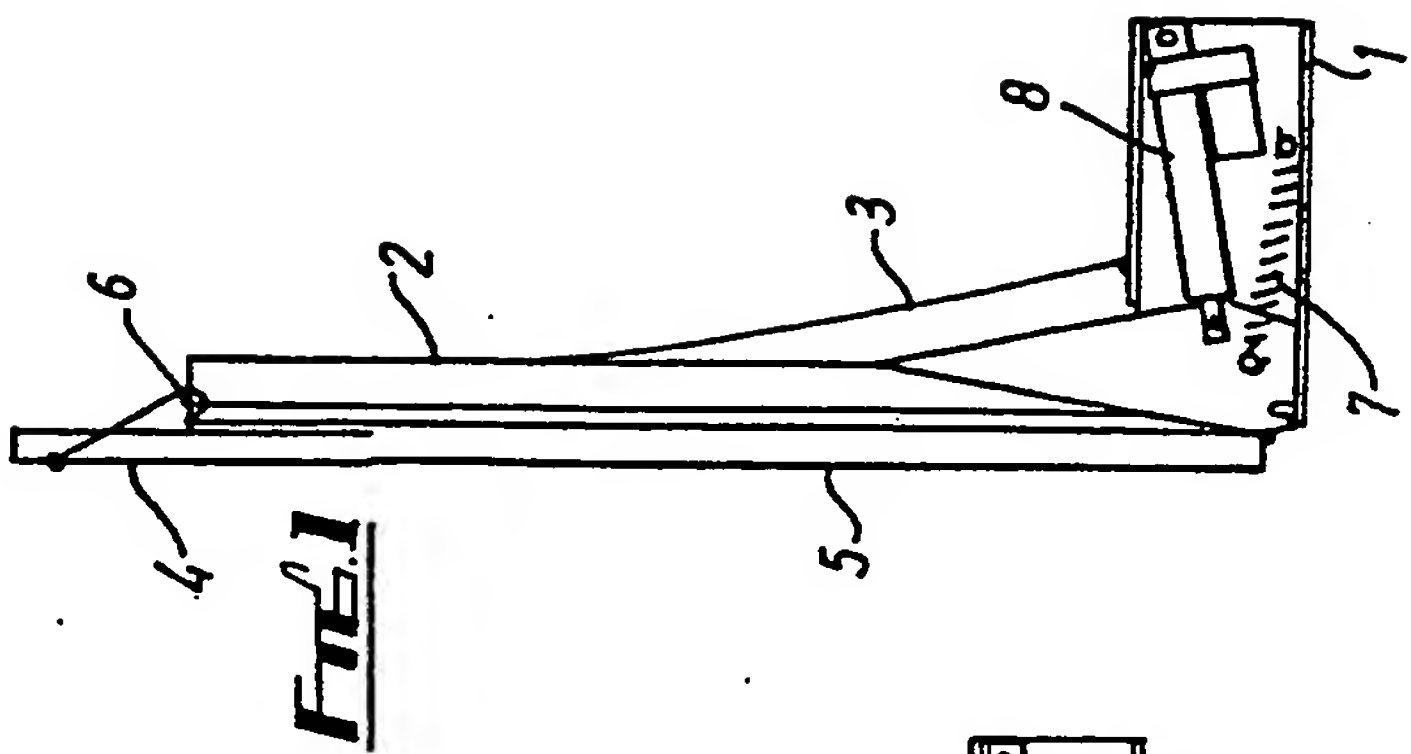


The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy

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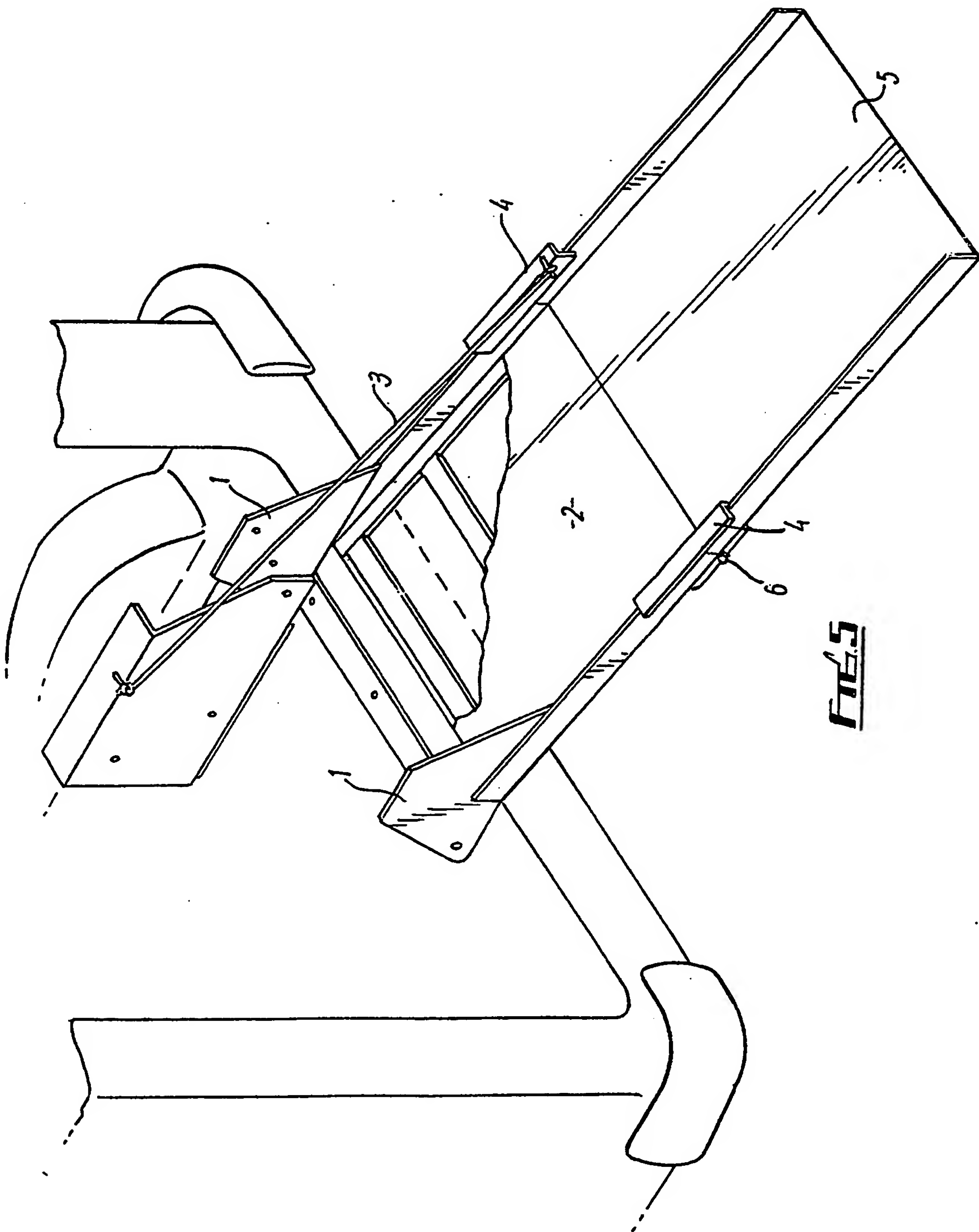


FIG. 5

SPECIFICATION

Collapsible ramp

5 This invention relates to a collapsible ramp, particularly but not exclusively for use with automobiles. The ramp finds especial application in providing easy access to motor vehicles for disabled persons confined to wheelchairs.

10 Hitherto when disabled persons dependent upon wheelchairs for mobility have needed to travel by motor vehicle, they have had to transfer to the vehicle seating from the wheelchair and then load the empty wheelchair into the vehicle or resort to
15 use of power lifts of the sort used for loading commercial vehicles. Such a transfer is a difficult operation, particularly where different levels of seat are involved. The lifts commonly used are expensive, take up a large space within the vehicle and
20 involve the user being lifted vertically on a small platform, which can cause anxiety.

According to the present invention a collapsible ramp comprises a first section pivotally secured to a support, a second section pivotally secured to the
25 first section remote from the support and a linkage secured to and extending between the support and the second section, the ramp being movable between a collapsed position and an extended position, the linkage being arranged to cause the second
30 section to form continuous surface with first section when the ramp is extended.

Preferably said linkage is secured to a lever extending from said second section. The lever may extend from the second section in the direction of
35 pivotal movement of the latter as the ramp is extended. Alternatively the lever may extend from the vicinity of the pivot in a direction remote from the body of the second section.

The linkage may serve to ensure that the second
40 section extends automatically to form a continuous surface with the first section as the ramp is extended.

The linkage is preferably either non extensible or extensible to a limited extent. The linkage may take
45 the form of a chain, cord, hinged rigid member, a telescopic member and may incorporate a spring to damp the movement thereof.

The ramp may be extensible and retractable by means of a hydraulically or electrically powered
50 actuator. Alternatively the ramp may be manually operable. Spring loadings may be provided to counterbalance the weight of the ramp.

A ramp in accordance with this invention may be permanently or temporarily attached to an auto-
55 mobile to provide access for a person confined to a wheelchair. Permanent attachment is preferred.

The vehicle employed may be slightly larger than normally used for personal transport but allows the user to remain seated in their familiar wheelchair
60 during transfer. By using a ramp, one end of which may be placed on the ground and the other resting securely on the floor of the vehicle, the user has freedom from anxiety about safety. Once inside the vehicle there is the choice of remaining seated in the
65 wheelchair, suitably clamped into position, or of

transferring to either the driving seat or other seating which may conveniently be swivelled to facilitate easy transfer. The larger vehicle may be provided with beds, toilet, washing and cooking facilities, etc., to give independence whilst travelling or it may provide space for a number of disabled users. The provision of any necessary hoists or lifting equipment which may be installed within the vehicle is simplified.

70 Preferably the ramp is located at the interior of a door of a vehicle. The door and ramp may be situated at either the side or rear of the vehicle. The ramp is preferably arranged to stow in a vertical position.

80 The two sections when extended preferably result in a slope sufficient to be climbed using a powered or hand propelled wheelchair. The gradient is preferably not more than 1:4.

The invention may be better appreciated from the following description by way of example with reference to Figures 1 to 5 of the accompanying drawings, of which:-

Figure 1 illustrates a collapsed ramp in accordance with the invention for use in conjunction with a
90 vehicle;

Figure 2 illustrates the ramp in a partially extended state;

Figure 3 illustrates the fully extended ramp;

Figure 4 is a partial enlargement of *Figure 1*; and

95 *Figure 5* is a perspective view of the ramp secured to a vehicle.

The ramp shown in the Figures 1 to 4 comprise one of a pair of brackets 1 which is secured by a pivot (not shown) to a first section 2. The bracket 1 is
100 secured to the floor just inside the door of the vehicle (not shown). A cord 3 is secured to the bracket 1 and to a lever 4 which extends from a second section 5 in a direction remote from the body thereof. The first and second sections are pivotally connected at 6.
105 The cord 3 may be conveniently replaced by a chain, hinged member telescopic member or rigid member attached to the bracket by means of a slotted attachment point.

The length of the cord 3 is arranged so that it
110 becomes taut as the ramp is extended (*Figure 2*). The lever 4 serves to pull the second section 5 into alignment with the first section 2 as shown in *Figures 2* and *3*.

A spring 7 extends between a bracket 1 and the
115 first section 2 and serves to damp the movement of the ramp as it is extended and also make the ramp self-stowing. The spring may alternatively compensate for the weight of the ramp to facilitate manual stowing. A door may be arranged to bear against the
120 second section 5 when the ramp is collapsed and may serve to prevent the ramp from moving when not in use. The vehicle door and/or ramp may be provided with buffers.

A latch may be provided to maintain the position
125 of the ramp in the event of failure of the door lock.

The ramp is preferably extended by means of electrically powered actuators 8 although manual or hydraulic means may be employed or block and tackle pulley system. The actuators which may be of
130 the Warner or other convenient type, are preferably

attached to the bracket and first section above the spring (as shown in Figure 4).

The actuator may be powered from the vehicle batteries and may be controlled by a simple rocker switch. One or more switches may be sited so that the operator is clear of the mechanism being operated, e.g. inside the outer edge of the door and on the dashboard. A limit switch may only allow electrical power to reach the actuator when the door is fully open.

For operation by a person confined to a wheelchair the ramp may incorporate a dual switching mechanism and remote door opening and closing. A parallel-wired rocker switch may be located inside the vehicle for lowering the ramp after the door is opened by remote control and also for raising the ramp after entry.

The system is not confined to use by persons confined to a wheelchair, it is equally valuable for commercial vehicle loading when sack trucks could be wheeled in and out of the vehicle as an alternative to the expensive and time-consuming tail-gate lift or the manual loading of goods.

Figure 5 shows a ramp in accordance with this invention secured to the rear door of a van or similar automobile. The ramp has similar construction to that shown in Figures 1 to 4 and like components bear the same reference numerals as in those Figures.

A further application for the system is for access to buildings. A ramp of this construction could have an extended length of 4m which on a 1:4 slope would give a rise of 1m. This could easily be fitted into a normal width and height door. In such static-applications the whole mechanism could be swivel-mounted so that it could be stored at right-angles to the doorway and not impede normal traffic. For static applications mains-powered actuators are available.

The ramp may also be employed for loading aircraft and shipping.

CLAIMS

1. A collapsible ramp comprising a first section pivotally secured to a support, a second section pivotally secured to the first section remote from the support and a linkage secured to and extending between the support and the second section, the ramp being movable between a collapsed position and an extended position, the linkage being arranged to cause the second section to form a continuous surface with the first section when the ramp is extended.

2. A ramp as claimed in claim 1, wherein said linkage is secured to a lever extending from said second section.

3. A ramp as claimed in claim 2, wherein the lever extends from the second section in the direction of pivotal movement of the latter as the ramp is extended.

4. A ramp as claimed in claim 2, wherein the lever extends from the vicinity of the pivot in a direction remote from the body of the second section.

5. A ramp as claimed in any preceding claim, wherein the linkage serves to ensure that the second section extends automatically to form a continuous surface with the first section as the ramp is extended.

6. A ramp as claimed in any preceding claim, wherein the linkage is inextensible.

7. A ramp as claimed in any of claims 1 to 5, wherein the linkage is extensible to a limited extent.

8. A ramp as claimed in claim 6, wherein the linkage comprises a chain, cord or hinged rigid member.

9. A ramp as claimed in claim 7, wherein the linkage comprises a telescopic member.

10. A ramp as claimed in any preceding claim, adapted to be permanently attached to an automobile.

11. A ramp as claimed in claim 10, adapted to be located at the interior of a door of a vehicle.

12. A ramp as claimed in any preceding claim adapted to stow in a vertical position.

13. A ramp substantially as hereinbefore described with reference to the accompanying drawings.

New claims or amendments to claims filed on 3 June 1983

Superseded claims 1

New or amended claims:-

1. A disabled persons vehicle collapsible ramp comprising a first section pivotally secured to a support, a second section pivotally secured to the first section remote from the support and a linkage secured to and extending between the support and the second section, the ramp being movable between a collapsed position and an extended position, the linkage being arranged to cause the second section to form a continuous surface with the first section when the ramp is extended.

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